Amendments to the Specification:

Please replace the paragraph beginning at page 1, line 1 with the following amended paragraph:

This application is a continuation-in-part application of U.S. Patent Application Serial No. 10/368,187, filed on February 18, 2003, now abandoned, which is a continuation-in-part application of U.S. Patent Application Serial No. 09/535,849, filed on March 27, 2000, now abandoned. This application claims priority under 35 USC ~~§119(e)~~ §120 to U.S. Patent Application Serial No. 09/535,849, filed on March 27, 2000, now abandoned, and U.S. Patent Application Serial No. 10/368,187, filed on February 18, 2003, now abandoned, the entire contents of which are hereby incorporated by reference.

Please replace the paragraph beginning at page 3, line 1 with the following amended paragraph (a comma has been inserted after "plan" in the fourth line):

In another aspect of the invention, a method for developing a trajectory plan for use with a vehicle that includes a vehicle suspension system that includes a trajectory planning system for developing a trajectory plan, a controllable suspension element for urging a point on the vehicle to follow the trajectory plan, includes recording a profile that includes data points, the data points representing positive and negative vertical deflections of a travel path; smoothing data of the profile, the smoothing providing positive and negative values; and recording the smoothed data as the trajectory plan.

Please replace the paragraph beginning at page 5, line 5 with the following amended paragraph:

In another aspect of the invention, a surface vehicle includes a payload compartment; a front surface engaging device; a rear surface engaging device; and a suspension system including a front controllable suspension element for exerting a force between the front surface engaging device and the payload compartment to modify the distance between the front surface engaging device and the payload compartment, the front controllable suspension element having a

centered position, the front controllable suspension element including a centering subsystem for urging the front controllable suspension element toward the centered position, the front controllable suspension element further ~~includes~~ including a measuring system to measure the amplitude of a road disturbance encountered by the front surface engaging device; and a rear controllable suspension element for exerting a force between the rear surface engaging device and the payload compartment to modify the distance between the rear surface engaging device and the payload compartment, the rear controllable suspension element having a centered position, the rear controllable suspension element including a controllable centering subsystem for urging the rear controllable suspension element toward the centered position; and controlling circuitry, responsive to the measuring system, for disabling the rear suspension element centering subsystem.

Please replace the paragraph beginning at page 6, line 7, with the following amended paragraph:

In another aspect of the invention, a method for operating a vehicle including a payload compartment and a first surface engaging device and a second surface engaging device, the vehicle further including a suspension system, the suspension system including a first controllable suspension element for exerting a force between the first surface engaging device and the payload compartment to modify the distance between the first surface engaging device and the payload compartment, the suspension system further including a second controllable suspension element for exerting a force between the second surface engaging device and the payload compartment to modify the distance between the second surface engaging device and the payload compartment, each of the first controllable suspension element and the second suspension element ~~includes~~ including associated sensors to measure at least one of vertical acceleration, vertical velocity, vertical road deflection, suspension displacement, and force applied by the controllable suspension, ~~the method~~ includes operating the vehicle on a road segment having disturbances so that the first surface engaging device encounters the disturbances before the second surface engaging device; measuring, by the sensors associated with the first

controllable suspension element, the disturbances; and based on the measuring, causing the second controllable suspension element to exert a force related to the disturbance before the second surface engaging device encounters the disturbance.

Please replace the two paragraphs beginning at page 8, line 2 with the following two amended paragraphs:

FIGS. ~~10A and 10B~~ 10a, 10b, and 10c are diagrams of a vehicle operating on a road surface in accordance with the invention; and

FIGS. ~~11A – 11C~~ 11a – 11c are diagrams illustrating the operation of a vehicle operating on a road surface in accordance with the invention.

Please replace the paragraph beginning at page 12, line 14 with the following amended paragraph:

FIG. 3 shows an example of the operation of a conventional active suspension without a trajectory planning subsystem. In FIG. 3, when front wheel 14f' encounters sloped section 41, ~~controllable suspension element 18f' exerts a force to shorten~~ the distance between payload compartment 16' and front wheel 14f' is shortened. When the rise *r* due to the slope approaches the maximum [[lower]] displacement of the suspension element, suspension element [[14f']] 18f' is "nosed in" to slope 41, and in extreme cases may reach or approach a "bottomed out" condition, such that there is little or no suspension travel left to accommodate bumps in the rising surface.

Please replace the two paragraphs beginning at page 13, line 13 with the following two amended paragraphs:

The example of FIGS. 4a – 4c illustrates the principle that following the trajectory plan may occur with little or no net force being applied by the controllable suspension element 18 and that execution of the trajectory planning subsystem may affect the normal operation of an active suspension. In FIGS. 4b and 4c, the vehicle is experiencing upward acceleration, and the normal

reactionary operation of the active suspension would shorten the distance between wheel 14f and the payload compartment 16 as shown in FIG. 3. With a suspension according to the invention, operating with a trajectory plan, the active suspension could remain in a centered position, so that the vehicle payload compartment follows trajectory plan 47. Alternatively, the operational example of FIGS. 4b – 4c could be combined with the operational example of FIG. 5 below so that the vehicle payload compartment follows trajectory plan 47[[a]].

FIG. 5 shows another example of the operation of an active suspension with a trajectory planning subsystem. Road profile 50 includes a large bump 52. Microprocessor 20 (of FIG. 2a or 2b) furnishes a computed trajectory plan 54 appropriate for road profile 50. At point 56, before wheel 14 has encountered bump 52, controllable suspension element 18 exerts a force to gradually lengthen the distance between wheel 14 and payload compartment 16. As wheel 14 travels over bump 52, the normal operation of the controllable suspension element 18 causes controllable suspension element 18 to exert a force, which shortens the distance between payload compartment 16 and wheel 14. When wheel 14 reaches the crown 57 of bump 52, controllable suspension element 18 begins to exert[[s]] a force, which lengthens the distance between payload compartment 16 and wheel 14. After wheel 14 has passed the end of bump 52, controllable suspension element 18 exerts a force shortening the distance between payload compartment 16 and wheel 14. The example of FIG. 5 illustrates the principle that the trajectory planning subsystem may cause the controllable suspension element 18 to exert a force to lengthen or shorten the distance between wheel 14 and payload compartment 16 even on a level road and further illustrates the principle that the trajectory plan may cause the controllable suspension element to react to a disturbance in the road before the disturbance is encountered.

Please replace the three paragraphs beginning at page 14, line 26 with the following three amended paragraphs:

The trajectory plan may take perceptual thresholds of vehicle occupants into account. For example, in FIG. 5, even less vertical acceleration would be encountered by the occupants of the vehicle if the trajectory plan began rising before point 56 and returned the vehicle to the

equilibrium position after point 58. However, the difference in vertical acceleration may not be enough to be perceived by the vehicle occupants, so the active suspension need not react before point 56 or continue to react past point 58. Additionally, if the vehicle includes a conventional suspension spring, the force applied by the active suspension between points 56 and [[47]] 57 may need to exert a force to extend the spring in addition to a force to lift the vehicle, so not beginning the rise of the trajectory plan until point 56 may consume less power than beginning the rise earlier.

Referring now to FIG. 6a, there is shown a method for developing, executing, and modifying a trajectory plan by a system without optional locator system 24. At step 55, sensors 11, 13, 15 collect road profile information and transmit the information to microprocessor 20 which records the road profile in profile storage device 22. At step [[58]] 157, the profile microprocessor compares the road profile information with road profiles that have been previously stored in profile storage device 22. The comparison may be accomplished using a pattern matching system as described below. If the road profile information matches a road profile that has previously been stored, at step 62a, the profile is retrieved, and microprocessor 20 calculates a trajectory plan appropriate for that profile. Concurrently, at step 62b, sensors 11, 13, 15 furnish signal representations of the road profile that may be used to modify, if necessary, the profile stored in profile storage device 22.

If it is determined at step 58 that there is no previously stored road profile that matches the road profile information collected in step [[56]] 55, at step 64 controllable suspension element 18 acts in a reactionary mode.

Please replace the paragraph beginning at page 21, line 1 with the following amended paragraph (a comma has been replaced with a semicolon in line 1):

As stated above, the data is expressed in positive and negative terms[[,]]; for example a bump may be treated as a positive value and a depression (or "pothole") treated as a negative value. The data smoothing maintains positive and negative values. Maintaining positive and negative values in the data enables the trajectory plan to urge the controllable suspension element

to apply a force in either direction, for example, to shorten the distance between the wheel and the passenger compartment in the case of a bump and to lengthen the distance between the wheel and the passenger compartment in the case of a depression. Maintaining positive and negative data values is not required for active suspension systems that modify controller parameters such as gain, and therefore expressing the data in a form that is always positive, such as root-mean-square, is sufficient. Active suspension systems that control gain control how the suspension will exert a force to shorten or lengthen the distance between the wheel and the passenger compartment responsive to a road disturbance only when the road disturbance is encountered; whether the disturbance is positive or negative can be determined when the disturbance is encountered. An active suspension system according to the invention exerts a force to lengthen or shorten the distance between the wheel and the passenger compartment before the disturbance is encountered; therefore it is desirable that data for a suspension system according to the invention retain positive and negative values.

Please replace the paragraph beginning at page 24, line 7 with the following amended paragraph (a period has been inserted at the end of the paragraph):

FIGS. 10a – 10c each show diagrammatic views of a vehicle and a road surface, illustrating the application of the invention to the front and rear wheels. The "front to rear" feature is especially useful when a vehicle is traversing a portion of road for the first time, and for which no road profile is available. The vehicles of FIGS. 10a and 10b use information from sensors associated with a front wheel to develop a trajectory plan for the rear wheel. This feature of the invention is illustrated by showing the trajectory of a point 114 in the passenger compartment above a front wheel 14f, and the trajectory of a point 116 in the passenger compartment above a rear wheel 14r. Front and rear wheels 14f and 14r are mechanically coupled to payload compartment 16 by corresponding controllable suspension elements 18f and 18r, respectively. The vehicle is operating on a road that has a disturbance 112a that has a height h1, which is greater than the available suspension stroke with the suspension in a centered position, and which is smaller than total combined suspension stroke (that is the combined

available upwards and downwards suspension travel with the suspension element in a centered position). When front wheel 14f encounters disturbance 112a, the suspension reacts to keep the trajectory of point 114 flat. As the suspension bottoms out, or approaches bottoming out, for example at point 118, the upward force caused by the road disturbance is transferred to point 114, so that point 114 follows a path 120. As described above, many suspension systems have centering systems for preventing the suspension from bottoming out and for maintaining available suspension stroke; the action of these systems also results in an upward acceleration of point 114 and a path similar to path 120.

Please replace the two paragraphs beginning at page 26, line 18 with the following two amended paragraphs:

In FIG. 11b, when rear wheel 14r encounters the beginning 136 of long upslope 138, the microprocessor issues a command to the rear suspension element to remain in a centered position and not to react to the upslope. The result is that the rear point 116 follows a path that is similar to the upslope of the road, and which causes the occupants of the vehicle, especially the occupants of the back seat, to experience less vertical acceleration and velocity when the rear wheel encounters the upslope than when the front wheel encounters the upslope. Additionally, they experience the amount of upward acceleration that they expect, and ~~experienced~~ <u>experience</u> the upward acceleration when they expect it.

The example of FIGS. 11a and 11b illustrates the feature that a controllable suspension according to the invention may react to some road stimuli less than a conventional reactive suspension. In an actual implementation, the operational example of FIG. 11b may be combined with the operational example of FIG. 10a to lessen the upward acceleration at point 136 of FIG. 11a – 11b so that the actual trajectory spread the [[a]] upward acceleration over a longer ~~vertical~~ <u>horizontal</u> distance, such as in trajectory [[130a]] <u>130A</u> of FIG. 11c.